

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Exam: Function Reflections (Practice version 20)

1. Let function  $f$  be defined by the polynomial below:

$$f(x) = 8x^5 + 4x^4 - 3x^3 - 2x^2 - 7x - 6$$

Draw lines that match each function reflection with its polynomial:

Reflections

$-f(-x)$  •

$f(-x)$  •

$-f(x)$  •

Polynomials

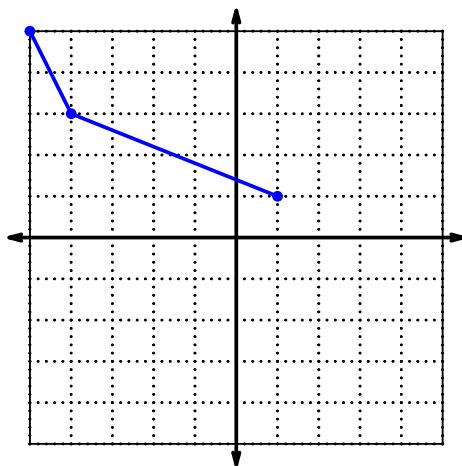
•  $-8x^5 + 4x^4 + 3x^3 - 2x^2 + 7x - 6$

•  $-8x^5 - 4x^4 + 3x^3 + 2x^2 + 7x + 6$

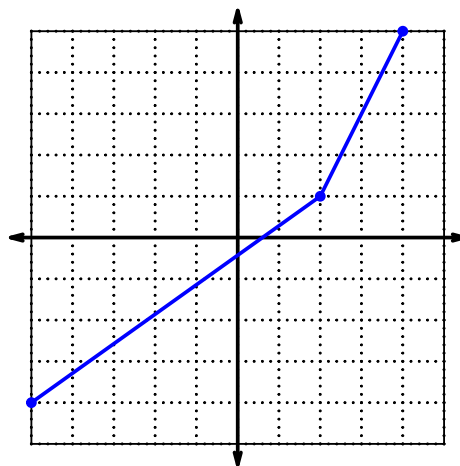
•  $8x^5 - 4x^4 - 3x^3 + 2x^2 - 7x + 6$

2. In each  $xy$  plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The  $x$  axis is horizontal and the  $y$  axis is vertical (as typical), and the scale is equal on both axes.

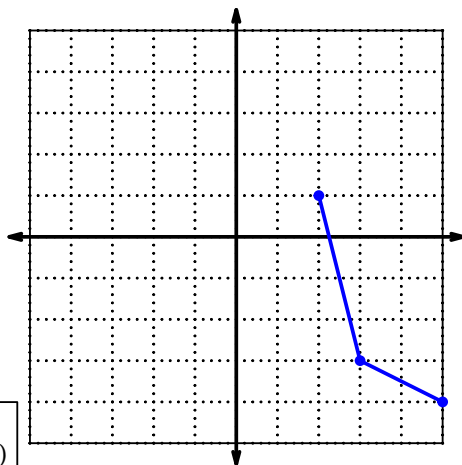
•  $y = g(x)$   
•  $y = g(-x)$



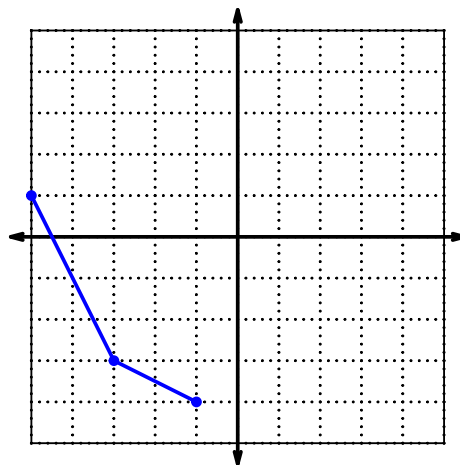
•  $y = h(x)$   
•  $y = -h(x)$



•  $y = m(x)$   
•  $y = -m(-x)$



•  $y = p(x)$   
•  $y = p^{-1}(x)$



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For all questions on this page, the functions  $f$ ,  $g$ , and  $h$  are defined by the table below.

$x$	$f(x)$	$g(x)$	$h(x)$
1	8	4	9
2	7	7	8
3	1	5	6
4	3	8	2
5	5	1	4
6	9	2	5
7	2	6	1
8	6	9	3
9	4	3	7

3. Evaluate  $g(3)$ .

4. Evaluate  $f^{-1}(9)$ .

5. Assuming  $f$  is an **even** function, evaluate  $f(-1)$ .

6. Assuming  $h$  is an **odd** function, evaluate  $h(-7)$ .

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7. A function,  $f$ , is **even** if  $f(x) = f(-x)$  for all  $x$  in the domain. A function,  $g$ , is **odd** if  $g(x) = -g(-x)$  for all  $x$  in the domain.

Let polynomial  $p$  be defined with the following equation:

$$p(x) = x^3 + 1$$

- a. Express  $p(-x)$  as a polynomial in standard form.

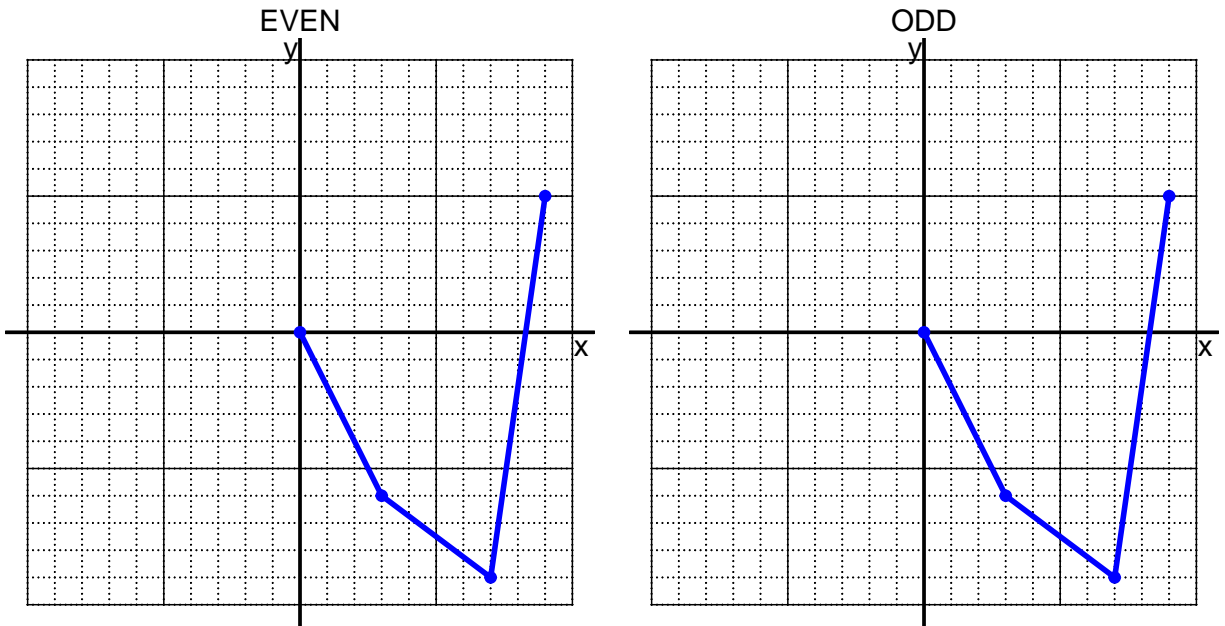
- b. Express  $-p(-x)$  as a polynomial in standard form.

- c. Is polynomial  $p$  even, odd, or neither?

- d. Explain how you know the answer to part c.

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8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function  $f$  be defined with the equation below.

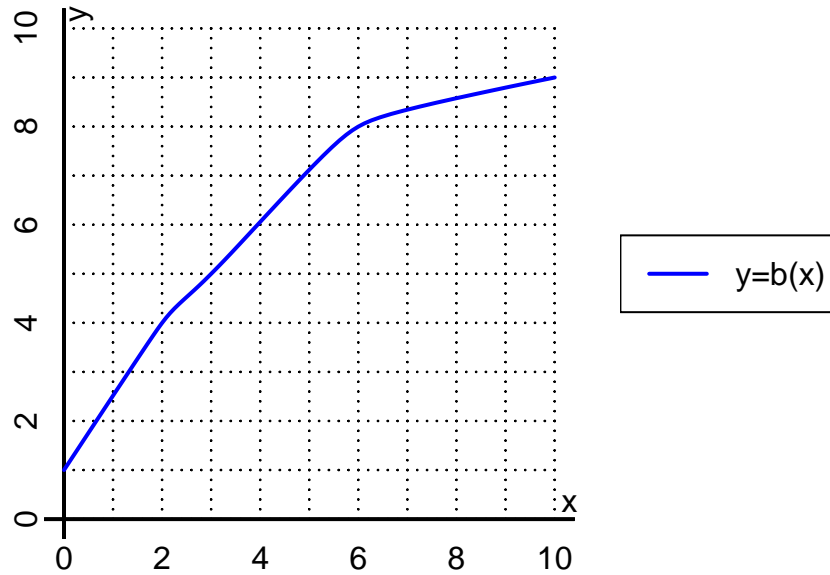
$$f(x) = 2x - 8$$

a. Evaluate  $f(33)$ .

b. Evaluate  $f^{-1}(54)$ .

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10. The function  $b$  is represented by the curve  $y = b(x)$  graphed below.



a. Evaluate  $b(2)$ .

b. Evaluate  $b^{-1}(8)$ .

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11. Function  $f$  is defined by the table below.

a. Complete the columns for  $-f(x)$  and  $f(-x)$  and  $-f(-x)$ .

$x$	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	8			
-1	-9			
0	0			
1	-9			
2	8			

b. Is function  $f$  even, odd, or neither?

c. How do you know the answer to part b?